Hiroshi TOBE*: **Notes on the morphological variation of *Clematis tosaensis* and its taxonomic problems****

戸部　博*：トリガタハンショウヅルの変異と分類**

Clematis tosaensis Makino is a climbing, perrenial subshrub and it is characterized by having ternate leaves, white-coloured perianth and solitary inflorescences fasciculed at the base of the current year shoot. This species is indigenous to Japan and has a wide distribution, ranging from southern to northern part of Japan, and it exhibits considerable variations in the gross morphology, and taxonomic confusions have been occurred frequently between the present species and its related taxa.

Tamura (1954) studied taxonomy of the eastern Asiatic species of *Clematis* and he treated *C. japonica* Thunb. var. *brevipedicellata* Makino as a synonym of *C. tosaensis*, regarding the former form (var. *brevipedicellata*) as large-sized plants distributed in northern Honshu, and the latter as small-sized plants distributed in southern Honshu and Shikoku district. However, his treatment does not seem to be supported by the later literature, because he did not show any reliable basis for it.

I have already used the name *C. tosaensis* in a wider sense including *C. japonica* var. *brevipedicellata* (Tobe, 1974). The purpose of this paper is to discuss the variations and taxonomy of *C. tosaensis*.

Materials observed in the present study are living plants collected from various localities and dried specimens deposited in the herbaria of the following institutions: Tohoku University (TUS), the Botanical Garden, Tohoku University (TUSG), Iwate University (IWA), National Science Museum, Tokyo (TNS), Department of Botany, University of Tokyo (TI), Makino Herbarium at Tokyo Metropolitan University, Tokyo (MAK) and Kyoto University (KYO).

---

* Faculty of Sciences, Chiba University, Yayoicho 1-33, Chiba. 千葉大学理学部系統学研究室.

** This work was carried out principally at Tohoku University, Sendai (in 1971-72).

Observation and discussion

Distribution and habitat. As shown in Fig. 1, *C. tosaensis* occurs commonly in Shikoku, Kinki, Chubu and Kanto districts and in the southern part of Tohoku district along the Pacific coast. Forma *fusco-purpurea*, which can be distinguished only by slightly purplish perianth, occurs sparsely in Tohoku and Kanto districts (cf. Tamura, 1966). Although *C. tosaensis* f. *cremea* (=*C. japonica* var. *cremea*) was described (Tamura, 1954; Makino, 1914), I was not able to locate any specimen nor find it in the field. *C. tosaensis* grows on gravelly or loamy soils, more or less rich in humus, along trails in lowland to montane zone. Sometimes they propagate themselves vegetatively. If a younger shoot elongates and attaches to a

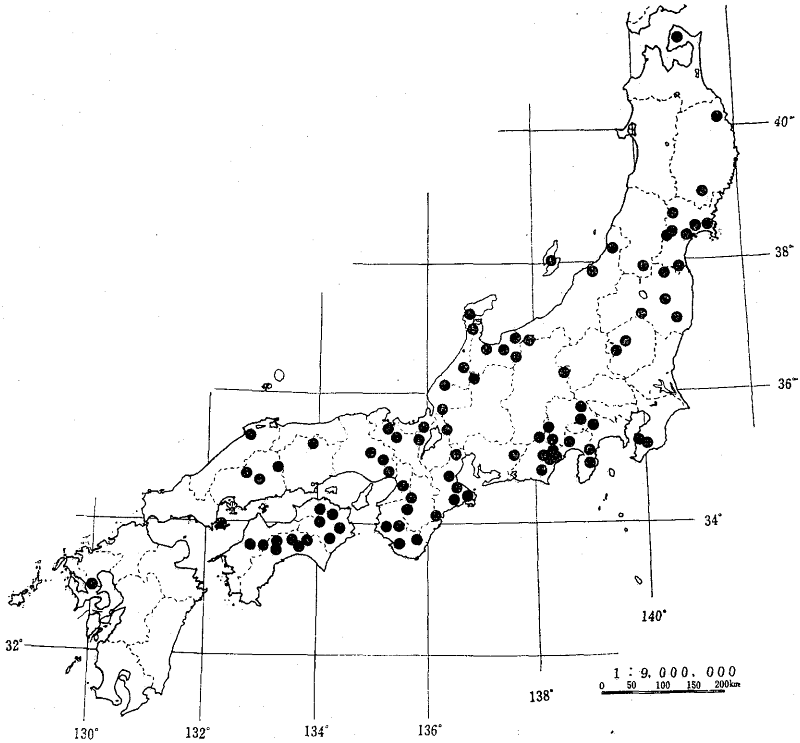

Fig. 1. Distribution map of *Clematis tosaensis*.

moderately moist ground, 2-4 roots extend from one node. In Tohoku district, for instance, this species grows in a population of various size, trailing on the ground mainly in the forests of *Cryptomeria japonica*, where the vegetative propagation prevails.

Leaf. The leaf is usually ternate, rarely simple in the younger shoot, and the distal margin of leaflets is nearly entire to serrate. There is very wide range of variation in leaf size, and a conspicuous difference in size is observed between the plants distributed in the southern part (Fig. 2A) and those distributed in the northern part of Japan (Fig. 2B). These variations are shown in Fig. 3. From Fig. 3 it is very obvious that leaves have a tendency to increase their size towards northern Japan. Fig. 4 shows the correlation of leaf-size and the length of floral axis (=bracteate stalk terminated with a flower). It is also very distinct that the plants with large-sized leaves have longer floral axes.

Length of floral axis and petiole. It has hitherto been said that *C. tosaensis* has usually a shorter floral axis than a petiole (Makino, 1904). In

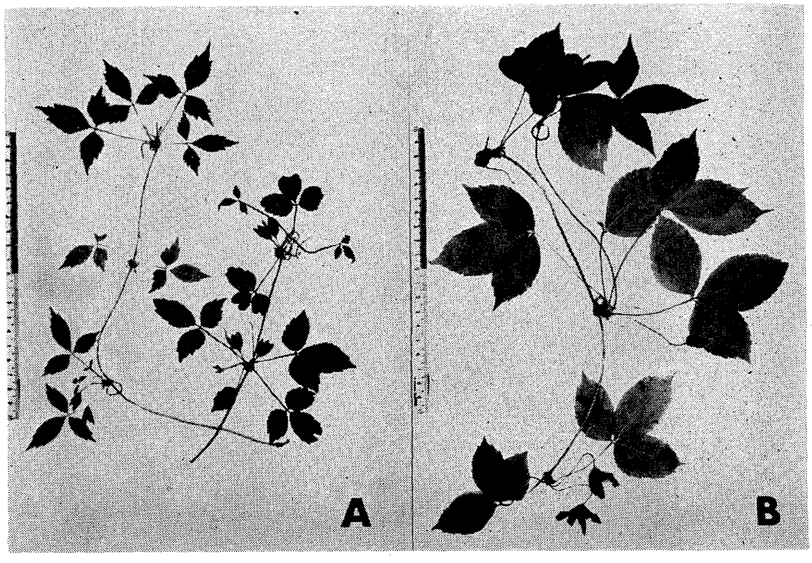

Fig. 2. Two collections showing conspicuous difference of size. A was collected from Mt. Kōtsu, Tokushima Pref. (34° N Lat., Long. 134°2′ E) and B from Omoshiro-yama, Miyagi Pref. (38°3′ N Lat., Long. 140°5′ E).

Fig. 5, the correlation between the length of petiole and floral axis is shown. Because *Clematis japonica* has been considered to be very close to *C. tosaensis,* I indicated the same correlation in Fig. 5 together with *C. tosaensis*. *C. tosaensis* has obviously shorter floral axes than petioles. Therefore, it can be said that the plants with longer floral axes have longer petioles with larger leaves. On the contrary, *C. japonica* has longer floral axes than petioles.

Position of bracts on a floral axis. The bracts are attached to the base of floral axes, and they are usually concealed among the scale leaves. However, the plants with bracts attached to a slightly upper position from the base of axes are frequently found (Fig. 6; cf. Okuyama, 1935), particularly in the northern part of Honshu (Fig. 7). Such a character corresponds to that of *C. tosaensis* f. *cremea* or *C. japonica* var. *cremea*, which has hitherto been known only from Nikko. According to the descriptions given by Tamura (1954), and Makino (1914) *C. tosaensis* f. *cremea* or *C. japonica* var. *cremea* has the bracts attached to nearly middle part of floral axes. But, I was not able to find this form among the specimens collected from Nikko. *C.*

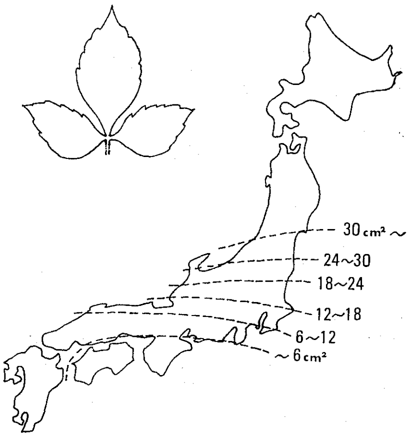

Fig. 3. Clinal variation of leaf-size. 6 cm^2, 12 cm^2, . . . , 30 cm^2 indicate the mean value of leaf-area. Dotted lines indicate the boundary of distribution of each value.

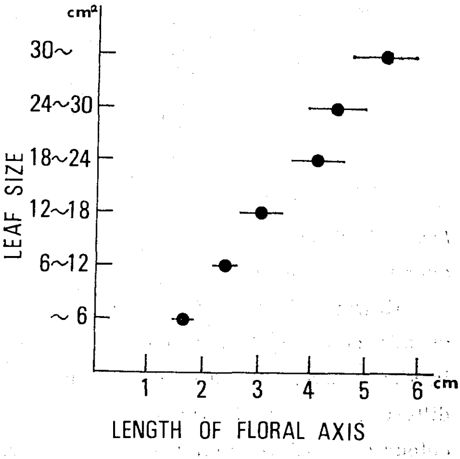

Fig. 4. Relationship between leaf size and length of floral axis.

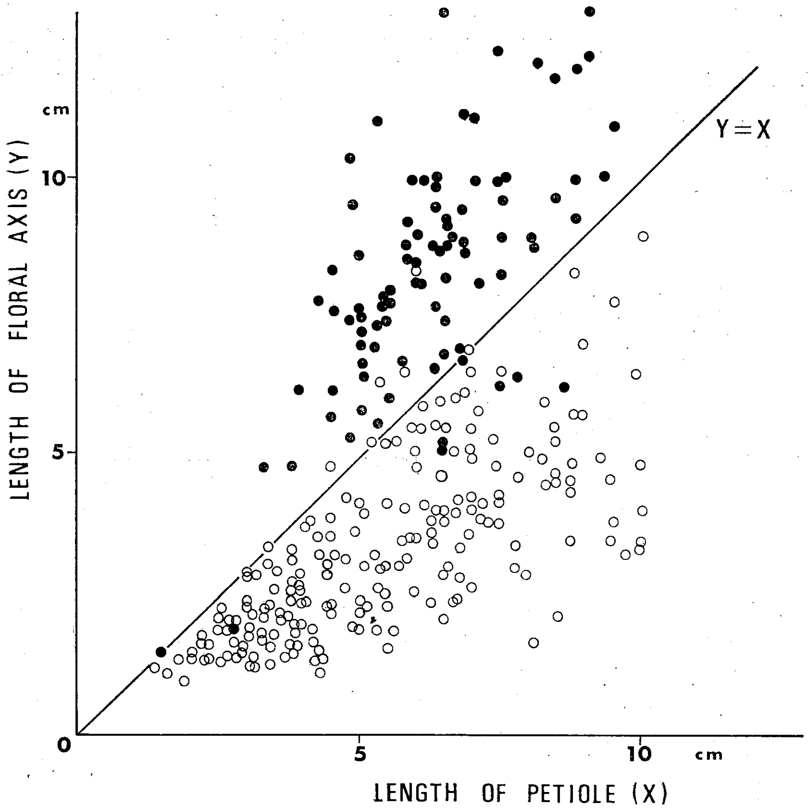

Fig. 5. Scatter diagram showing the relationship between the length of petiole and floral axis. ○ *C. tosaensis*, ● *C. japonica*.

tosaensis f. *cremea* or *C. japonica* var. *cremea* seems to be based on the over-estimation of more or less deviated phenotype of *C. tosaensis*.

Flower. The flower is characteristically nutant, campanulate and usually consists of four sepals arranged in a whorl. The sepal is variable in size, shape, thickness, colour and indumentum. The length of sepals is different in every flower of the same plant, being about 1.5–2.5 cm. The colour of sepal is creamy to greenish-white in *C. tosaensis*, and slightly purplish in f. *fusco-purpurea*. At the younger stage the sepal is wholly

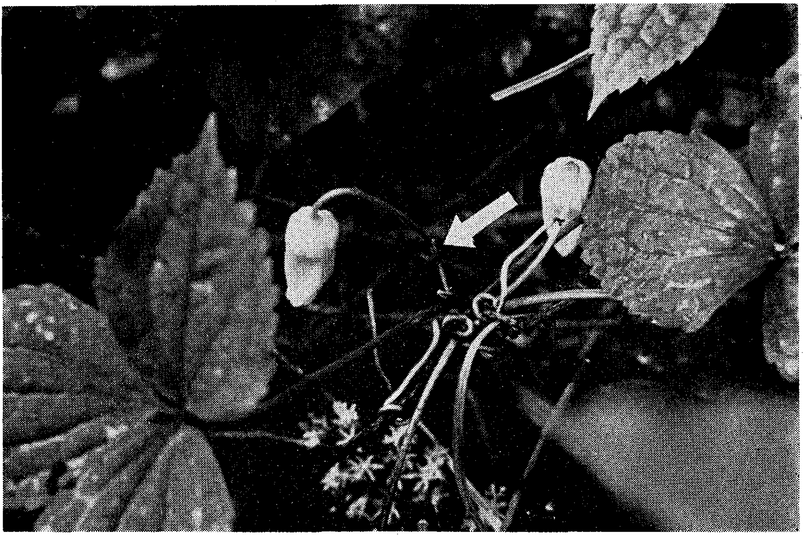

Fig. 6. The plant in which some floral axes are bracteate normally at the base but other floral axes bracteate at a little upheld position as pointed with an arrow.

covered with long eglandular hairs, but later it becomes pubescent. The plants distributed in the southern region have thinner sepals but those distributed in the northern region have thicker ones. However, the difference of thickness is very gradual and there is no clear regional distinction. Like other species (cf. Salisbury, 1920), *C. tosaensis* has numerous stamens and carpels. The stamens vary 24–40 in number and the carpels 11–26. The anthers are 2.0–3.5 mm in length and nearly glabrous except for the connective portion. The indumentum of filaments slightly

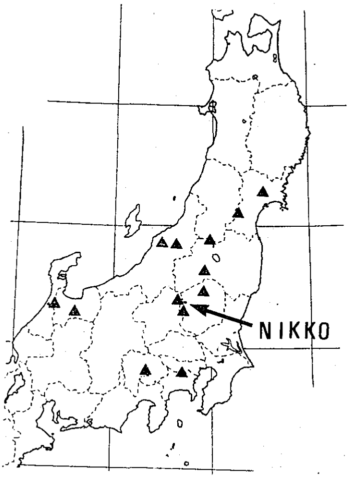

Fig. 7. Distribution map of plants corresponding to one represented in Fig. 6.

differs from stamen to stamen in the same flower, and pilose at least on the upper half. The length of filaments varies even in the same flower, 10–15 mm; the filaments nearby sepals are usually longer than those nearby carpels. The mature achenes are about 6 mm in length, ovate and nearly glabrous, with villous tails. The tails are 1.5–2.5 cm in length.

Conclusion

Clematis tosaensis is very variable in floral and vegetative characters. Leaf, petiole, floral axis, sepal, etc. increase their size towards the northern Honshu, and the bracts are never stable in their position on floral axes. As all of these characters vary gradually from the southern to the northern region, I think that the infraspecific categories of *C. tosaensis* as var. *brevipedicellata* and f. *cremea* are untenable. Some of these infraspecific taxa were combined with *C. japonica*, but *C. japonica* is distinctly different in that the colour of sepal is purplish, the bracts are attached to nearly middle parts of floral axes and the floral axes are longer than the petioles.

Basing on the above observations, *Clematis tosaensis* can be characterized as follows:

Clematis tosaensis Makino, Bot. Mag. Tokyo **18**: 51 (1904); Tamura, Acta Phytotax. Geobot. **15**: 117 (1954); Ohwi, Fl. Jap. ed. 2, 597 (1965).

Syn.: *C. japonica* var. *brevipedicellata* Makino, Bot. Mag. Tokyo **18**: 51 (1904); *C. japonica* var. *tosaensis* (Makino) Ohwi, Fl. Jap. ed. 1, 513 (1953); *C. japonica* var. *cremea* Makino, Bot. Mag. Tokyo **28**: 28 (1914); *C. japonica* f. *cremea* (Makino) Ohwi, Fl. Jap. ed. 1, 513 (1953); *C. tosaensis* f. *cremea* (Makino) Tamura, Acta Phytotax. Geobot. **15**: 117 (1954).

Scandent, perrenial subshrub; leaves ternate, with 6–30 cm^2 area; petioles 1–10 cm long; inflorescences solitary, mostly subtended by scale leaves; floral axes 1–8 cm long, shorter than petioles, bibracteate at the base; flowers four-sepaled, nutant, campanulate; sepals about 1.5–2.5 cm long, spathulate-oblong, obtuse at apex, greenish-white to creamy white in vivo, slightly pubescent on abaxial surface, nearly glabrous on adaxial surface; anthers 2.0–3.5 mm long; filaments 10–15 mm long, pilose at least on the upper half; achenes narrowly ovate, attenuate above, glabrous, about 6 mm long; tails about 1.5–2.5 cm long, villous.

F. **fusco-purpurea** Sugaya, Ecol. Rev. **14**(2): 177 (1956).

Syn.: *C. japonica* f. *purpureo-fusca* Hisauchi, J. Jap. Bot. **8**: 218 (1937).

Sepals slightly purplish in vivo.

Acknowledgements. I wish to express my gratitude to Dr. K. Sohma, Tohoku University, for his helpful suggestions and encouragement throughout this study. Sincere thanks are also due to Mr. K. Okamura who kindly sent me living plants collected from the type locality, Mt. Torigata, Kochi Pref.

References

Hisauchi, K. 1937. J. Jap. Bot. **13**: 218. Makino, T. 1904. Bot. Mag. Tokyo, **18**: 51. ——, 1914. Ibid. **28**: 28. Ohwi, J. 1953. Fl. Jap. Okuyama, H. 1935. Natural Science and Museum, **71**: 15. Salisbury, E. J. 1920. Ann. Bot. **34**: 107–116. Sugaya, S. 1956. Ecol. Rev. **14**: 117–182. Tamura, M. 1954. Acta Phytotax. Geobot. **15**: 117–127. ——, 1966. Sci. Rep. Osaka Univ. **15**: 25–38. Tobe, H. 1974. Sci. Rep. Tohoku Univ. **37**: 47–53.

* * * *

トリガタハンショウヅルの形態学的変異を明らかにした。広い分布域を持つこの種は，葉面積・花梗の長さ・葉柄の長さ・萼片の厚さなどにおいて，地方により大きな差異を示すが統計学的に見れば，それらの形質はいづれの場合も分布域の南方から北方へと生育する個体に依って連続的に数値を増す。こうした事実は，従来アズマハンショウヅル (*Clematis japonica* Thunb. var. *brevipedicellata* Makino) と呼ばれてきたものはトリガタハンショウヅルと同一物であり，前者は関東・東北南部産の大型の個体に，後者は四国・近畿南部産の小型のものに当てられていたとする田村氏の見解 (1954) を支持するものである。

また，日光特産と言われてきたシロハンショウヅル (*C. japonica* Thunb. var. *cremea* Makino, *C. tosaensis* Makino f. *cremea* (Makino) Tamura) は実在するならハンショウヅルの白花品あるいはトリガタハンショウヅルの長梗品と考えられてきたように，花色は白で花梗の中央付近に一対の苞が見られなくてはならないが，厳密に記載に合う個体は調査したどの標本室にも見当らない。本来，トリガタハンショウヅルとして分類されている個体の苞は花梗の基部に付着しているため，鱗片葉の中に隠れて見えないのが普通であるが，日光付近に産するものの中に同一個体でありながら苞が正常に花梗の基部に付着している場合と苞以下の節間の伸長によって基部よりはやや上方部に苞が付着してハンショウヅルに近い条件を示す場合とが共に観察さ

れることがある（奥山，1935 参照）。こうした個体がトリガタハンショウズルの変異の範囲内にあることは明らかであり，シロハンショウズルという名も上述した形質がたまたま顕著に現われた個体に名づけられたものと思うが，たとえ変種や亜種のレベルでも taxon として確立するには当らない。

□毎日新聞社：**手漉和紙**　全3冊，袂入り，和紙和装；解説書 pp. 148；標本紙編（上）pp. 145，生漉紙 200 点張込；（下）pp. 185，漉模様紙，加工和紙等 250 点張込；毎日新聞社，東京，1975年5月，¥80,000。なお国が指定した無形文化財保持者が製作した六葉を附録としている。日本の紙は中世に庶民社会に徹底しはじめ，江戸時代になって旧藩の支持を受けて大いに発達した。明治の最盛期に生産家は6万8千を数えたのである。それが，近代化の波におされて急速に衰え，今は800余に過ぎないという。現存する和紙を集めるのはもう最後と思われたので，毎日新聞社はその創刊百周年紀念として，各方面の支持のもとに，手漉和紙大鑑全5巻を編んだのが昭和49年であった。それがすでに絶版なので，その中から解説の大部分を再録し，森田和紙の森田康敬専務の収集による，生漉紙 200 点と，加工和紙等 250 点を以て，3巻としたのであるという。3000部の限定出版である。8万円は高いが，上述の次第をみると止むをえないと思われる。解説編には，和紙の歴史，製法，産地の現状，正倉院の紙，美術工芸，文学等との関係，年表，文献を挙げている。色々と教えられるところが多いが，ケンフェルの Amoenitatum を異邦珍事誌と訳したり，コウゾの品種にコウゾ，カジノキ，ツルコウゾなど4品種があるとするなどは少々困る。標本紙編は大体 6×10 cm の横長に切った紙を左側に3枚毎はり，右側に解説を印刷してある。じつにデリケートな差異があって中々あきることがない。説明をみると多くのものが廃絶におびやかされていることを痛感する。標本紙篇下巻は種々なすかしや模様があってにぎやかであるが，京千代紙の模様の差などは少し的をはずれた感なきにしもあらずである。（前川文夫）

□広東省植物研究所：**海南植物誌**　第三巻 Flora Hainanica tom. 3 pp. 629 ff. 527–942 科学出版社 1974, Oct. 5.7元 1965年に第一，第二巻が出版されてから，ようやく第三巻が出た。本書にはクロウメモドキ科からあとの離弁花類と合弁花類とを含んでいる。科，属，種毎に記載を添え，属間の検索表も加え，また主な種には挿図もあるし，栽培種にも及んでいるのでかなり意慾的である。学名には出典も挙げ，巻末には26ページの新群の記載もついている。正宗氏のリストと較べると，たとえば *Symplocos* は15種から26種に *Hedyotis* は15種が25種とかなり増加しているので，内容は相当充実したことがわかる。速やかな完成を祈る。定価 2,280 円は安い。

（前川文夫）